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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/711,420

09/17/2004

Robert W. Zehner

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EXAMINER

HOLTON, STEVEN E

ART UNIT

PAPER NUMBER

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/711,420	Applicant(s) ZEHNER ET AL.	
	Examiner Steven E. Holton	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-17, 34, 36-42, 44-50 and 52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 41, 42, 44-50 and 52 is/are allowed.
- 6) ☒ Claim(s) 1, 3-5, 7-10, 12-17, 34, 36, 37, 39 and 40 is/are rejected.
- 7) ☒ Claim(s) 2, 6 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is made in response to applicant's amendment filed on 1/23/2008. Claims 1-10, 12-17, 34, 36-42, 44-50, and 52 are currently pending in the application. An action follows below:

Response to Arguments

2. The Applicant's arguments regarding claims 41-50 and 52 are persuasive in light of the amendments to the claims to incorporate previously indicated allowable subject matter.

New rejections are being provided for independent claims 1, 34, and 36 and other dependent claims that were previously indicated as allowable subject matter based on newly found prior art. The change in position on these claims means that this rejection is made non-final.

Claim Objections

3. Claim 10 is objected to because of the following informalities: Claim 10, line 2, the phrase "a plurality of second electrode are provided" should be "a plurality of second electrodes are provided". Appropriate correction is required.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the electro-optic

display with a layer of electro-optic material, first and second electrodes on opposed sides must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. These features are distinctly named in claims 9 and 10 regarding the structure of the display device.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-5, 7, 8, 12-16, 34, 36, 37, 39, and 40 are rejected under 35

U.S.C. 102(e) as being anticipated by Zhou et al. (USPgPub: 2005/0179641), hereinafter Zhou.

Regarding claims 1 and 34, the claims are drawn to a method of operation and associated display device and are considered together. Zhou discloses a display device with a method of generating driving waveforms. The driving waveforms used by Zhou include a plurality of pulses such that a method of operation includes displaying a first image (Figs. 3-6; each of the waveforms is discussed as starting at a first gray scale level and the pixel is being driven to a second gray scale level at the end of the waveform; paragraph 38 has one such description) and then rewriting the display to display a second image (Figs. 3-6 show driving waveforms to change the output of the display to a different gray scale levels that would be included in different images; paragraph 38 discloses that the pixels are changing from one gray scale level to another level) and all of the pixels undergoing non-zero transitions have a waveform

that have their last period of non-zero voltage terminating at substantially the same time (Figs. 3-6; the individual driving waveforms all have a final waveform (V_{dr}) terminating at the same time for changing the pixel to final state; paragraph 52 discusses V_{dr} for all transitions occurs at the same time so that all selected pixels will have their final driving waveform occurring and ending at the same time). Regarding the application of a driving waveform for all pixels in the display undergoing a non-zero transition, Zhou discloses that in the case that all pixels are undergoing the same transition all of the pixels may be simultaneously selected and the same driving waveform applied (paragraph 63). Obviously, if all pixels are selected and driven with the same waveform the last non-zero voltage period would terminate at the same time for all pixels.

Regarding claim 3, Zhou discloses that the V_{dr} signal can have the same duration (paragraph 42).

Regarding claim 4, Zhou discloses the waveforms having a plurality of pulses and having transitions occurring at substantially the same time (Fig. 4, shaking pulses SP1 and SP2 provide transitions at the same time; paragraph 54).

Regarding claims 5, 7, and 8, Zhou discloses a bistable, microencapsulated, electrophoretic display device (paragraph 34).

Regarding claim 12, Zhou discloses using an arbitrary voltage as part of the driving waveforms for driving the pixels (Fig. 4, each waveform has a changing voltage level that at least includes a voltage of $-V$, 0, or V).

Regarding claim 13, for any of the transition waveforms disclosed by Zhou the summation of the voltages used for the driving waveform is bounded by time. The

waveforms shown in Fig. 4 will clearly have a bounded integral because there is a finite total of the sum of the voltages applied during the waveform's duration.

Regarding claim 14, Zhou discloses that the amount of the driving voltage V_{dr} is based on the starting and ending gray levels (paragraph 34).

Regarding claim 15, Zhou discloses at least one waveform has a last period that includes a series of pulses of alternating polarity (Fig. 4, the last time period including SP2 and V_{dr} includes pluses of alternating polarities).

Regarding claim 16, Zhou shows the voltages used for the waveform have maximum and minimum voltage levels equal to those used in the rest of the waveform (Fig. 4).

Regarding claim 36, Zhou discloses a method of driving a display so that all pixels are providing with a final period of voltage beginning at the same time (Figs. 3-6; the last waveform V_{dr} starts at the same time for all waveforms).

Regarding claims 37, 39, and 40, Zhou discloses a bistable, microencapsulated, electrophoretic display device (paragraph 34).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9, 10, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou.

Regarding claim 9, Zhou discloses the display device having an electro-optic layer (Fig. 1, element 7) with electrodes on opposite sides of the layer (Fig. 1, elements 5 and 6). At the time of invention it would have been a matter of design choice to select the spacing between the first and second electrodes to be at least twice the spacing between adjacent pixels of the display. The spacing of the electrodes and pixels would be a matter of design choice based on size of the display area, ability to print electrodes within specific sizes and the desired resolution and layout of the display device. Thus, it would have been a matter of design choice for one of ordinary skill in the art to select spacing of electrodes relative to the spacing of pixels based on the display device layout and manufacturing ability for forming pixels and electrodes for the display.

Regarding claim 10, Zhou provides a single first electrode for the entire display (Fig. 1, element 6) and a plurality of second electrodes for defining each pixel (Fig. 1, elements 5 and 5').

Regarding claim 17, Zhou discloses the use of waveform pulses of differing durations when driving the display device (Fig. 3D, the durations of pulses in SP1 and SP3 are different). At the time of invention it would have been obvious to one of ordinary skill in the art that the duration of the shaking pulses of Zhou could be selected to be a desired duration or amplitude based on the desired image quality (paragraph 55). Similarly it would be understood to one of ordinary skill in the art how to change the duration or amplitude of a voltage pulse for being applied to the display device. Therefore, it would have been a matter of design choice to select voltage pulses having durations not greater than one-tenth of a pulse needed to drive the pixel from one extreme optical state to another extreme optical state.

Allowable Subject Matter

7. Claims 41, 42, 44-50, and 52 are allowed.

Claims 2, 6, and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The present invention is directed to a method of driving an electrophoretic display device using a specific driving waveform. Dependent claim 2 identifies the uniquely distinct features driving pixels undergoing a zero transition and a non-zero transition simultaneously for the entire display and having all pixels driven by a waveform having

a last non-zero voltage period terminating at substantially the same time. The closest prior art, Zhou and Ando et al. (USPN: 7106277) disclose methods of driving pixels with waveforms with final non-voltage periods terminating at the same time, but not all pixels of the display undergoing both non-zero and zero transitions, either singularly or in combination, fail to anticipate or render the above underlined limitations obvious.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven E. Holton whose telephone number is (571)272-7903. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven E. Holton
Division 2629
April 17, 2008
/Bipin Shalwala/

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Supervisory Patent Examiner, Art Unit 2629